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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/733,952	12/12/2000	Si Wook Han	K-243	5156

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EXAMINER

WILLIAMS, JOSEPH L

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 05/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/733,952

Applicant(s)

HAN ET AL.

Examiner

Joseph L. Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 8-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6 and 7 is/are rejected.
- 7) ☒ Claim(s) 3-5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-7, in Paper No. 6 is acknowledged. The traversal is on the ground(s) that the search for both inventions would not be burdensome. This is not found persuasive because a full and complete search for the method of manufacturing requires several classes that are not required for the search of the final structure alone.

The requirement is still deemed proper and is therefore made FINAL.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

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Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

5. Claims 1-7 are objected to because of the following informalities: Regarding claim 1, it is not clear from the claim whether or not the field emission display, particularly the cathode array, is a side by side structure or a stacked cathode array. This ambiguity is a result of the wording of lines 4-5. In particular, the phrase "*insulating layers and carbon nanotube films... formed alternately on the cathode electrode*" (emphasis added) could imply a stacked device because the structural limitations are not claimed to be side-by-side.

Further regarding claim 1, and in addition claims 2, 6, and 7, the single and plural form of the words layer and film is not consistent. Claim 1 discloses layers and film in line 3; however, when those limitations are referred back to (as in line 6 of claim 1, line 1 of claim 2 (line 7 overall), line 1 of claim 6 (line15 overall), and line 1 of claim 7 (line17 overall)) the single form of the word is used. Is it several layers and films or just one layer and film?

Due to their dependency, claims 3-5 are necessarily included in this objection.

Appropriate correction is required.

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Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 6, and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Coll et al. (US 6,100,628).

Regarding claim 1, Coll ('628) teaches in figure 8 and in column 11, lines 1-55 a field emission display (800) comprising a cathode array (801), the cathode array including: a cathode electrode (820) formed on a substrate (810); insulating layers (850) and carbon nanotube layers (830 and column 6, lines 20-26) for use as emitter electrodes formed alternately on the cathode electrode; and a gate electrode (860) formed on the insulating layer.

Regarding claim 6, the Examiner notes that the claim limitation of the carbon nanotube film being formed by chemical vapor deposition by using a microwave in a range of 2 to 5 GHz, is drawn to a process of manufacturing, which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing

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of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113).

Regarding claim 7, Coll ('628) teaches in column 11, lines 34-36 that the carbon nanotube film has a thickness of 0.5-2 microns.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coll et al. (US 6,100,628), of record, in view of Kitayama (JP359190230A).

Regarding claim 2, Coll ('628) teaches all of the claimed limitations except for the insulating layer being a coat of glass paste containing photoresist.

The thickness of the insulating layer is derived from Coll ('628) teaching in column 11, lines 23-24 that the emitter well has a depth of 1 micron, which would have to make the thickness of the insulating layer to be at least less than 1 micron, which would fit in the claimed range.

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Further regarding claim 2, Kitayama ('230) teaches (see the abstract) the use of an insulating layer comprised of a coat of glass paste containing a positive-type photoresist for the purpose of forming a glass film pattern having high precision which is easier to manufacture.

Hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the insulating composition of Kitayama in the display of Coll for the purpose of forming a glass film pattern having high precision which is easier to manufacture.

Allowable Subject Matter

9. Claims 3-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Regarding claim 3, the prior art of record neither shows nor suggest a gate electrode comprised of a metal sol solution with a 10 – 200 Angstrom grain size containing a photoresist.

Due to their dependency, claims 4 and 5 are necessarily included in the indication of allowable subject matter.

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Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gray (US 5,214,347) and Okita et al. (US 6,489,710) disclose a stacked emitter; Asai et al. (US 6,445,124) discloses the state of the art for field emission displays; JP 10072240 (abstract only) discloses the state of the art for an insulating barrier.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph L. Williams whose telephone number is (703) 305-1670. The examiner can normally be reached on M-F (6:30 AM-3:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Joseph Williams
Examiner
Art Unit 2879
May 26, 2003